

NASA TECH BRIEF

Manned Spacecraft Center



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Estimating Carbon Monoxide Exposure

Following a study of the nature of carbon monoxide poisoning and its relationship to human exposure a novel method of predicting the effects of carbon monoxide on astronauts confined in the artificial atmosphere of a spacecraft was developed. From this, precise correlations of carbon monoxide poisoning, breathing rates, and variations in atmospheric conditions have been established.

The nature of carbon monoxide toxicity, and two novel equations have also been developed. From these equations it is possible to estimate the carboxy haemoglobin form when carbon monoxide is inhaled and when adjustments for pulmonary ventilation are necessary.

The results of the study emphasized the need for a low carbon monoxide toxicity level in spacecraft with an upper limit of 17 mg/m^3 . Means to monitor and control the build-up of concentrations of the gas are important not only in artificial atmospheres but in confined spaces also. Sources of carbon monoxide are discussed, and allusion is made to some unusual generators of this gas - such as paints, marking ink, and activated charcoal.

Although the investigations were concerned primarily with an aerospace problem the information revealed has widespread application. Industrial installa-

tions, such as coke ovens and power plants; domestic gas heating systems; and automobiles in congested city streets all generate carbon monoxide and constitute a potential hazard. Thus, the contents of this report will be of interest to all who are concerned with public health, including industrial safety officers.

Note:

Requests for further information may be directed to:

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No patent action contemplated by NASA.

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